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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/578,081

05/03/2006

Sverker Hartwig

AC-110

4774

7590

04/21/2008

Mark P. Stone
35 Third Street
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EXAMINER

ANDRISH, SEAN D

ART UNIT

PAPER NUMBER

3672

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/578,081	Applicant(s) HARTWIG ET AL.	
	Examiner SEAN D. ANDRISH	Art Unit 3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 23 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 - 23 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 May 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a) because they fail to show “main power supply means,” “flush medium,” and “computer means” as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. There is insufficient antecedent basis for the following claim limitation(s):
- a) Claim 1 – line 8, "the flush power";
line 11, "the percussion power";

lines 12 – 13, “the total power consumption”

- b) Claim 3 - line 3, “the power output”
- c) Claim 4 - lines 2 – 3, “the flush medium”
- d) Claim 5 - lines 2 – 3, “the flush medium”
- e) Claim 7 - lines 2 - 3, “the flush medium”
- f) Claim 11 - line 8, “the flush power”;
line 11, “the percussion power”;
lines 12 – 13, “the total power consumption”
- g) Claim 13 - lines 3 – 4, “the power output”
- h) Claim 14 - line 3, “the flush medium”
- i) Claim 15 - line 3, “the flush medium”
- j) Claim 17 - line 3, “the flush medium”
- k) Claim 22 - line 3, “the power output”
- l) Claim 23 - line 3, “the power output”

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3 – 9, 11, 13 – 19, and 21 – 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. (6,637,522).

Art Unit: 3672

With regard to claims 1, 11, and 21, Wilson et al. discloses a method for controlling efficiency comprising: using a controller to adjust flushing rate (column 4, lines 19 – 28 and lines 59 – 63) at least partly as a function of depth (column 17, lines 26 – 29), and controlling rotational rate and flushing rate (column 4, lines 19 - 28 and 59 - 63). Since the method as disclosed by Wilson et al. is used to optimize flushing rate and rotational rate, it would obviously involve the optimization of power consumption related to the flushing and rotational sub-processes.

Regarding claims 3, 13, 22 and 23, Wilson et al. discloses setting upper and lower thresholds of gauge pressure in the flushing mechanism to establish optimum rates of feed and/or drilling rotation (column 4, lines 19 – 28). By maintaining the feed rate and/or rotational rates below a predetermined threshold, the power output from the power supply means would obviously be maintained below a predetermined threshold.

Regarding claims 4, 5, 14, and 15, since Wilson et al. discloses maintaining flushing rates within set threshold limits to optimize feed rates, it would be obvious to hold the flow rate constant while the rate is within threshold limits and it would be obvious to adjust the flow rate when the flow rate exceeds or falls below threshold limits.

With regard to claims 6 and 16, Wilson et al. discloses continuously monitoring hole depth (column 17, lines 26 – 29).

Claims 7 and 17, flow of flush medium is continuously monitored (column 4, lines 19 - 28 and 59 - 63; column 5, line 57 – column 6, line 8).

Claims 8 and 18, computer means (33, 33') (column 11, line 62 - column 12, line 9).

Claims 9 and 19, computer means (33, 33') connected to a memory in which data including drill tool type is stored and that flush rate is determined based on stored values (column 11, lines 62 – 63; column 12, line 60 - column 13, line 31).

5. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. in view of Edlund et al. (5,358,058). Wilson et al. discloses all of the limitations of the above claim(s) except for adjusting flush power as a function of hole diameter and/or drill rod diameter. Edlund et al. teaches calculating drilling efficiency as a function of energy per unit volume of a borehole (column 3, lines 17 - 19) to optimize the life of the drill bit and to increase drilling efficiency. The examiner notes that the calculation of the volume of a borehole, with its cylindrical shape, would inherently include measuring the diameter of the borehole. It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the control of power consumption as disclosed by Wilson et al. with the monitoring of borehole diameter as taught by Edlund et al. to optimize the life of the drill bit and to increase drilling efficiency.

6. Claims 10 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al. in view of Rodert et al. (5,320,189). Wilson et al. discloses all of the limitations of the above claim(s) except for percussion is performed by a hydraulic top hammer. Rodert et al. teaches controlling the supply of driving medium to percussion drilling using a top hammer ([Fig 1]; column 1, lines 31 – 32) to increase the efficiency of a drilling operation. It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the drilling system as taught by Wilson et al. with the control of a percussion drilling system including a top hammer to increase the efficiency of a drilling operation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN D. ANDRISH whose telephone number is (571)270-3098. The examiner can normally be reached on Mon - Fri, 7:30am - 5:00pm, Alternate Fri off, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kenneth Thompson/
Primary Examiner
Art Unit 3672

SDA
4/16/2008